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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HALLENBECK-HUBER, JEREMIAH CHARLES	

ART UNIT	PAPER NUMBER
2486	

NOTIFICATION DATE	DELIVERY MODE
10/18/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/596,884	IJZERMAN, WILLEM L.	
	Examiner	Art Unit	
	JEREMIAH HALLENBECK-HUBER	2486	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 July 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-23* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-23* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *28 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 19-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Aritake et al (5696552).

In regard to claim 19 Aritake discloses a method for displaying a 3D image including:

providing a beam of a 2D frame including at least one row of an array of pixels each pixel including sub-pixels corresponding to elemental regions of the image in different view directions (Aritake Fig. 35 and col. 15 line 46 to col. 16 line 10 note image display 120 which generates a 2D 'beam' and phase display 122 which directs the beam into divergent directions, sequentially display rows of a 3D image, further note phase display 122 comprises a plurality of sub-pixels which correspond to different views as shown in figs. 30, 31, 32 and 35

directing the beam the elemental regions into respective divergent beams corresponding to the view direction (Aritake col. 15 line 46 to col. 16 line 10 note phase display 122 variably deflects light from pixels of the image display 120 thus generating divergent beams) and

successively refreshing the 2D frame, receiving the divergent beams at a scanning device having a rotary mirror element, tilting the rotary mirror element between each 2D frame display displaying them as rows of the 3D image (Aritake Fig. 35 and col. 15 line 46 to col. 16 line 10 note beams emitted from display 120-122 are reflected by mirror 124 and received by the screen 112 for display, also note rotation of mirror causes it to be tilted between each successive display of a 2D row).

In regard to claim 20 refer to the statements made in the rejection of claim 19 above. Aritake further discloses spreading the light containing the divergent beams in a direction transverse to the row direction in order to enlarge the viewing angle in the direction transverse to the row direction (Aritake Fig. 35 and col. 16 lines 1-10 note lenticular lenses 112 which are parallel to the row direction of display 120-122 act to spread the image in the transverse, vertical direction).

In regard to claim 21 refer to the statements made in the rejection of claim 19 above. Aritake further discloses separating the beams from different elemental regions before they are displayed on the display screen (Aritake Fig. 35 and col. 15 line 46 to col. 16 line 10 note phase display 122 separates the beams of light before they are projected onto the screen 112).

In regard to claim 22 refer to the statements made in the rejection of claim 22 above. Aritake further discloses creating 3D pixels on the display screen by directed all the separate beams corresponding to different sub-pixels of the same pixel onto the same small areas of the display such that the pixel emits light corresponding to different views of the same point of the image source in different directions (Aritake Figs. 18 and col. 10 line 59 to col. 11 line 7 note light from sub-pixels of pixel P_{1N} is deflected to corresponding viewing regions S_1-S_N which provide views of the point P_{1N} in different directions)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aritake in view of Woodgate et al (5808792).

In regard to claim 1 Aritake discloses a 3D image display comprising a frame of rows of pixels including:

at least one display unit for producing a beam of a 2D frame including at least one row of an array pixels including sub-pixels corresponding to elemental regions of the image in different view directions directed into respective divergent beams corresponding to the view directions (Aritake Fig. 35 and col. 15 line 46 to col. 16 line 10 note phase display 122 deflects light from pixels of the image display 120 which generates a 2D 'beam', also note phase display 122 comprises a plurality of sub-pixels as shown in fig. 35, further note Fig. 18 for expanded view of phase display sub-pixels). Aritake further discloses that the image display and phase display combine to generate a holographic display (Aritake col. 14 lines 33-37). It is noted that Aritake does not disclose a display and optical lens arrangement. However, Woodgate discloses a 3D display using one of a plurality of autostereoscopic elements for generating divergent beams including a lenticular apparatus which includes pixel rows with sub-pixels to display elemental regions of the image along into divergent beams using an optical lens arrangement (Woodgate Figs. 10 and 12 and col. 8 lines 25-32 note lenticular lenses 84 and 124 also pixels 120 and 122 shown divided into elemental regions also note Fig. 9 and col. 7 lines 32-48 for further description of different elemental regions). Woodgate further discloses that lenticular and holographic elements are interchangeable (Woodgate col. 9 lines 42-47). It is therefore considered obvious that one of ordinary skill in the art would recognize the advantage of substituting the lenticular lens and display of Woodgate for the holographic display of Aritake in order to gain the advantage of operation without a collimated light source as suggested by Woodgate

(Woodgate col. 9 lines 42-46 note holographic display requires a collimated white light source).

a driver connected to the display unit to drive the pixels of the display unit so as to refresh the 2D frame (Aritake Fig. 33 and col. 15 line 64 to col. 16 line 1 display control section 130 which is connected to 1 Dimensional Image Display 120, also Wood. col. 6 lines 57-59 video information provided in a time multiplexed manner implying a driver to provide the time-multiplexed information); and

an optical scanning system having a rotary mirror element to receive the divergent beams form the lens arrangement for the rows successively and display them as rows of the image frame (Aritake Fig. 35 and col. 16 lines 1-5 note galvano mirror 124); and

a control unit connected to the driver for changing a tilt of the rotary mirror element between each 2D frame display, causing the rows of the 2D frame to successively display as rows of a 3D image frame (Aritake Fig. 33 and col. 15 lines 46-63 note control section 130 which controls rotating galvanomirror 124, the rotation of which results in tilting of the mirror between successive 2D displays of the beam from display elements 120-122).

In regard to claim 2 refer to the statements made in the rejection of claim 1 above. Aritake further discloses a display screen onto which the optical scanning system directs the beams to form an image (Aritake Fig. 35 and col. 16 lines 1-10 particularly lines 1-5 note images are formed on display screen 112).

In regard to claims 3 and 4 refer to the statements made in the rejection of claim 2 above. Aritake further discloses a diffuser, comprised of lenticular lenses parallel to the row direction, for spreading beams in a direction transverse to the row direction (Aritake Fig. 35 and col. 16 lines 1-10 note lenticular lenses 112 which are parallel to the row direction of display 120-122 act to spread the image in the transverse, vertical direction).

In regard to claim 5 refer to the statements made in the rejection of claim 1 above. Woodgate further discloses means for focusing the elemental regions of rows of images onto the optical lens arrangement (Woodgate Fig. 10 and col. 7 lines 32-48 note lens 92 and first lenticular lens 82 focus light from backlights 88 and 90 through light modulator 80, which provides pixel data, and diffuser 86 onto the second lenticular screen 84, lens 92 and lenticular lens 82 correspond to the convex lens focusing means described in the specification on pg. 7 lines 3-5).

In regard to claim 6 refer to the statements made in the rejection of claim 5 above. Woodgate further discloses that the focus unit includes a plurality of converging lenses with different focal lengths in the horizontal and vertical direction to match the dimensions of the elemental region rows with the optical lens arrangement (Woodgate Fig. 10 and col. 7 lines 32 to 48 note lenticular screen 82 comprises a plurality of convex, or converging lenses with different horizontal and vertical focal lengths, also note lenticular screen 82 has 1/2 the pitch of lenticular screen 82 in order to match the dimensions of the spatial light modulator 80 to the lenticular screen 84).

In regard to claim 7 refer to the statements made in the rejection of claim 1 above. Woodgate further discloses that the optical lens arrangement includes lenticular lenses (Woodgate Figs. 10 and 12 note lenticular lenses 84 and 124).

In regard to claims 8 and 9 refer to the statements made in the rejection of claim 1 above. Aritake further discloses that the rotator mirror reflects divergent beams (Aritake col. 16 lines 1-5 note galvano mirror 124 rotates as shown in Fig. 35 and reflects divergent beams input from phase display 122, which is replaced with a lenticular lens as taught by Woodgate above).

In regard to claim 13 refer to the statements made in the rejection of claim 1 above. Aritake further discloses that each pixel includes one or more sub-pixels to provide sufficient elemental regions such that more than one observer can observe the 3D image simultaneously from slightly different views (Aritake Figs. 30 and 31 and col. 14 line 59 to col. 15 line 15 note display of Fig. 31 comprises horizontal sub-pixels 102 which provide viewing zones in Fig. 30, note each viewing zone displays a slightly different image each observer requires one zone for each eye to provide a 3D view, also note Fig. 18 a plurality of viewing zones, 11 shown in figure, are provided which are sufficient to provide views for more than one observer, finally note col. 15 lines 46-50 display of Figs. 33-37 corresponds to the display of Figs. 30 and 31).

In regard to claim 14 refer to the statements made in the rejection of claim 13 above. Aritake generally discloses that the display may comprise an unspecified number of elemental regions (Aritake Figs. 18 and 30 note regions S_1-S_n, and A_i to A_{i+k}). Aritake does not specify a particular number of elemental regions. However, Woodgate

suggests the desirability of including more than 50 such elemental regions (Woodgate col. 2 lines 25-29 note sixty views). It is therefore considered obvious that one of ordinary skill in the art would incorporate more than 50 elemental regions in the invention of Aritake in view of Woodgate in order to provide a "look around" type display as suggested by Woodgate (Woodgate col. 2 lines 25-27).

In regard to claim 15 refer to the statements made in the rejection of claim 1 above. Aritake further discloses that for each elemental region there is another elemental region such that the images relating to the two elemental regions are shifted by less or equal to the parallax between the eyes (Aritake Fig. 30 note views A_i and A_{i+k} corresponding to the parallax between eyes are separated by at least one other view, thus the elemental regions are shifted by less than the parallax between eyes).

Claims 10-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Aritake in view of Woodgate as applied to claim 8 above, and further in view of Hodges (4163990).

In regard to claim 10 it is noted that neither Aritake nor Woodgate disclose use of a concave mirror in the display of the row scanned image frames of the combined art. However, Hodges discloses a projection system using a concave mirror to present image frames from a display to viewers (Hodges Figs. 1, 2 and col. 2 lines 18-57 particularly note lines 38-42 optical system 18, includes reflective elements 19 and 20, further note lines 47-50 surfaces are concave to the CRT's, generally note reflected CRT image is projected onto screen 14). It is therefore considered obvious that one of

ordinary skill in the art would recognize the advantage of using a projection system, including a concave mirror as disclosed by Hodges in conjunction with the display of Aritake in view of Woodgate in order to easily accommodate a wide range of screen sizes as suggested by Hodges (Hodges col. 6 lines 1-8).

In regard to claim 11 refer to the statements made in the rejection of claim 10 above. Aritake further discloses a lens positioned in relation to the rotary mirror element such that the rotary mirror element does not perturb the focusing of the image in the direction transverse to the row direction (Aritake Fig. 35 and col. 16 lines 1-17 note lens 126 acts to focus the image in at least the vertical direction which is transverse to the row direction).

In regard to claim 12 refer to the statements made in the rejection of claim 10 above. Hodges further discloses that the projection system includes side mirrors which act with the concave mirror to focus image frames onto a display screen (Hodges col. 2 lines 18-24 note mirrors 12 and 13 located at the front and back sides of the housing are side mirrors which reflect the image from the concave elements 19 and 20 to the display screen 14).

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aritake in view of Woodgate as applied to claim 1 above, and further in view of DuBrucq (511103).

In regard to claims 16 and 17, it is noted that neither Aritake nor Woodgate disclose details of plural display units placed adjacent to each other parallel to or

transverse to the row direction. However, at the time of the invention it was well known in the art to provide an array of individual displays in directions both parallel and transverse to a row direction and to drive the displays such that image information is displayed simultaneously across the display units as disclosed by DuBrucq (DuBrucq Figs2&3 and col. 3 lines 29-35, note the displayed image may be divided into portions, each portion to be simultaneously displayed on a monitor also note col. 4 lines 23-35 note Fig. 2A plural monitor units adjacent horizontally, or parallel to the row direction, and vertically or transverse to the row direction). It is therefore considered obvious that one of ordinary skill in the art at the time of the invention would recognize the advantage of arranging several of the displays disclosed by Aritake in view of Woodgate, in a multi-monitor display configuration as taught by DuBrucq in order to provide a higher resolution display as suggested by DuBrucq (DuBrucq col. 3 lines 29-30),

Claims 18 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aritake alone as applied to claim 19 above and Aritake in view of Woodgate as applied to claim 1 above, and further in view of Woodgate et al (5465175 referred to as Woodgate-2 to avoid confusion).

In regard to claims 18 and 23, Aritake further discloses a display is suitable for moving image display (Aritake col. 21 lines 18-20). Aritake does not explicitly disclose that the moving images may be television or domestic video. However, Woodgate discloses a display suitable for domestic video such as computer games (Woodgate col. 12 lines 33-43). It is further noted that neither Aritake nor Woodgate explicitly disclose a

display used for television. However, at the time of the invention it was also common and notoriously well known in the art to use 3D displays, such as the display disclosed by Aritake and Woodgate, to display television as disclosed by Woodgate-2 (Woodgate-2 col. 1 line 55 to col. 2 line 4, note autostereoscopic display shown in e.g. Fig. 3, further note and col. 2 lines 47-51 use as a television display). It is therefore considered obvious that one of ordinary skill in the art at the time of the invention would recognize the advantage of utilizing the display of Aritake to display television and domestic video applications as suggested by Woodgate and Woodgate-2 in order to increase the variety of media upon which the display can operate.

Response to Arguments

Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection.

In regard to claim 1 the applicant first argues that Aritake fails to meet the claim limitations because Aritake discloses reflecting light from a galvano mirror 124 onto optical lenses 112, and thus does not disclose an optical scanning system receiving divergent beams from a lens arrangement as recited in claim 1. The examiner must disagree. The lenticular lens assembly 112 of Aritake was not cited to correspond to the claimed ‘optical lens arrangement’, rather Woodgate was relied upon to teach such a lens assembly. The closest component in Aritake to the optical lens assembly is the phase display array 122. The phase display of Aritake may comprise a liquid crystal layer sandwich between glass substrates (Aritake e.g. col. 13 line 58 to col. 14 line 30),

which is used to alter the phase of light output from display section 120 to form divergent beams which form a 3D image which are then reflected by galvano mirror 124 (Aritake col. 15 lines 17-44 also note Fig. 24 showing phase data corresponding to 'virtual opening' or view areas). Further, Aritake specifically discloses that the horizontal lenticular lens 112 is used only to expand the size of the displayed image (Aritake col. 16 lines 36-37). Additionally the applicant is applying a piecemeal analysis to the references. Aritake is not relied upon to teach an optical lens assembly in the rejection of claim 1, rather such limitations are to be found in Woodgate which discloses use of a vertically aligned lenticular lens to generate divergent beams for 3D display (Woodgate Figs. 10 and 12 and col. 8 lines 25-32) one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The applicant does not raise any additional arguments with regard to claims 2-23

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action. .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEREMAIAH C. HALLENBECK-HUBER whose telephone number is (571)272-5248. The examiner can normally be reached on Mon-Fri 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571)272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeremiah C Huber
Examiner
Art Unit 2486

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